Dependent machine claim **4** is intended to cover parallel implementation of the multipliers. In a parallel implementation, the first product and the second product are computed simultaneously. While the first real multiplier means uses the intermediate terms to compute a final result which is the first product, the second real multiplier means can use the intermediate terms to compute a final result which is the second product. The intermediate terms can be computed once, and then shared.

DESCRIPTION - CLAIM 5 AND CLAIM 6

Dependent machine claim **5** restricts the machine of claim **1** by including additive means for adding the first product and the second product to a first product sum. The first product sum is not a desired product of two numbers. This means that the first product sum cannot be an implementation of a multiplier in which partial product computations are shared, thus reducing the cost of the multiplication. It is intended that claim **5** highlight the differences between the present invention and prior art multipliers such as those of US Patent 4,868,778 and US Patent 5,841,684, which share computations in computing one product and which do not share computations in computing more than one product.

Dependent machine claim **6** restricts the machine of claim **1** by further including first additive means for adding the first product to a first product sum and second additive means for adding the second product to a second product sum. The first product sum and the second product sum are separate product sums.

Dependent machine claim **6** reinforces the idea that the shared computation of the machine of claim **1** can be used to compute different products that contribute to separate product sums. For instance, the invention can be used to compute the contribution of one transform input to a first transform output that is a sum of weighted inputs and to compute the contribution of that same transform input to a second, separate transform output that is also a sum of weighted inputs.

For the product sums to be separate, there should be at least one sum of products to which the first product sum contributes and to which the second product sum does not, or else at least one sum of products to which the second product sum contributes and to which the first product sum does not.

DESCRIPTION - CLAIM 7 AND CLAIM 8

Independent machine claim **7** covers an embodiment of the invention in which computations are shared in computing two products using a multiple-output multiplier. This embodiment of the invention comprises a first number in a first finite-precision numeric format, a second number in a second finite-precision numeric format, and a third number in a third finite-precision numeric format. The embodiment also comprises multiplier means for computing a first product and a second product. The first product is equal to the product of the first number and the second number. The second product is equal to the product of the first number and the third number.

The multiplier means of claim **7** uses at least one calculation result in computing the first product and also in computing the second product. Thus, while it may be treated as a single multiplier means capable of computing more than one output, the machine of claim **7** uses the same concept of sharing calculation results between two different product computations that is a key feature of embodiments using more than one multiplier.

Dependent machine claim **8** restricts machine claim **7** by requiring that the second product not equal the product of the first number and the complex conjugate of the second number except when the first number is zero or the second number is equal to the complex conjugate of the third number. Also, the second product is not equal to the product of the second number and the complex conjugate of the first number except when the first number is zero or the first number is real and the second number is equal to the third number.

The restrictions imposed in claim **8** on the products of claim **7** are intended to emphasize that a multiple-output multiplier with shared computation is not limited to computing a first product which is the product of two complex numbers and a second product which is the product of one of the complex numbers and the complex conjugate of the other complex number. Other complex number values may allow sharing of computation. Also, particular representations of other complex number values in particular finite-precision numeric formats may allow sharing of computation.

DESCRIPTION - CLAIMS 9 THROUGH 16

Claims **9** through **16** are method claims which are analogous to machine claims **1** through **8**. Method claims **9** through **16** are discussed briefly below.

Independent method claim **9** is a method used in computing one or more sums of products where at least one of the sums is not a desired product of two numbers. The method of claim **9** comprises first real multiplication of a first real number by a second real number and second real multiplication of the first real number by a third real number. The first real number is in a first finite-precision numeric format, the second real number is in a second finite-precision numeric format, and the third real number is in a third finite-precision numeric format.

The method of the first real multiplication produces a first product and a first set of intermediate terms. The method of the second real multiplication produces a second product, and uses at least one of the terms computed in the first real multiplication.

Dependent method claim **10** requires that the method of the second real multiplication of claim **9** not be able to compute the product of the first real number and the second real number. Dependent method claim **11** requires that the method of the first real multiplication of claim **9** not be able to compute the product of the first real number and the third real number. Claims **10** and **11** are intended to cover shared multiplication when one or both of the multipliers are not general multipliers.